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EXAMINER

KOVALICK, VINCENT E

ART UNIT PAPER NUMBER

2629

DATE MAILED: 03/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/602,765

Applicant(s)

KIM ET AL.

Examiner

Vincent E. Kovalick

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 20 and 21 is/are allowed.
- 6) ☒ Claim(s) 1-3, 10, 12 and 13 is/are rejected.
- 7) ☒ Claim(s) 4-9, 11 and 14-19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. This Officer Action is in response to Applicant's Amendment dated January 4, 2006 in response to USPTO Office Action dated October 4, 2005.

The amendments to claims 1, 5, 10; the addition of new claims 20 and 21 and Applicant's remarks have been noted and entered in the record.

Applicant's amendment to the specification, replacing paragraphs 0008, 0026, 0074, 0077, has been entered in the record.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Enomoto et al. (USP 5,796,379) taken with Kohno et al. (USP6,366,271) in view of Takeda (USP 5,270,697). Relative to claims 1, Enomoto et al. **teaches** a Liquid Crystal Display (LCD) adapted to realize multigray-scale display of high quality (col. 5, lines 17-67 and col. 6, lines 1-50); Enomoto et al. further **teaches** a driving apparatus for a liquid crystal display device, comprising: a liquid crystal display panel having a plurality of data lines and gate lines arranged in a matrix

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configuration; a data driver for supplying video data to the data lines; a gate driver for supplying gate pulses to the gate lines.

Enomoto et al. **does not teach** a timing controller for controlling polarity of the video data by supplying a selected a polarity inversion signal, from a plurality of polarity inversion signals, to the data driver and controlling timing of the data driver and the gate driver according to a number of horizontal synchronization signals supplied during a data blanking period, wherein a plurality of the polarity inversion signals are different from each other.

Kohno et al. **teaches** a method for driving a LCD apparatus and driving circuit therefor (col. 4, lines 66-67 and col. 5, lines 1-47); Kohno et al. further **teaches** a timing controller for controlling polarity of the video data by supplying a selected one of the first and the second polarity inversion signal to the data driver and controlling timing of the data driver and the gate driver according to a number of horizontal synchronization signals supplied during a data blanking period, wherein a plurality of the polarity inversion signals are different from each other (col. 2, lines 7-18).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to provide to the device as taught by Enomoto et al the feature as taught by Kohno et al. in order to put in place the means for driving the LCD device while inverting the polarity of the image signal in a predetermined cycle period in order to prevent the degradation of display quality.

Enomoto et al. taken with Kohno et al. **does not teach** selecting a polarity inversion signal from a plurality of polarity inversion signals.

Takeda **teaches** a display apparatus (col. 2, lines 41-68 and col. 2, lines 13); Takeda further **teaches** selecting a polarity inversion signal from a plurality of polarity inversion signals

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(col. 6, lines 5-19 and Fig. 4). (It being understood that Takeda teaches a first polarity inversion signal and a second polarity inversion signal, and the selection being made from a low level in the even-numbered field and a high level in the odd-numbered field).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to provide to the device as taught by Enomoto et al. taken with Kohno et al. the feature as taught by Takeda in order to precharge signal lines to a predetermined voltage level.

4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Enomoto et al. taken with Kohno et al. in view of Takeda as applied to claim 1 in item 3 hereinabove, and further in view of Lin et al. (Pub. No. US 2001/0046002).

Regarding claim 2, Enomoto et al. taken with Kohno et al. in view of Takeda **does not teach** the said driving apparatus wherein the polarity of the video data supplied to the LCD panel is inverted for each of two adjacent pixel cells.

Lin et al. **teaches** a dot inversion mode active matrix LCD display with pre-writing circuit.

(pg. 1, paras. 0008-0011); Lin et al. further **teaches teach** the said driving apparatus wherein the polarity of the video data supplied to the LCD panel is inverted for each of two adjacent pixel cells (pg. 2, para. 0018).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to provide to the device as taught by Enomoto et al. taken with Kohno et al. in view of Takeda the feature as taught by Lin et al. in order to put in place the means of an active matrix LCD with a pre-writing function which is applicable to be operate at an ultra-high frequency and to form a LCD panel with a high degree of resolution.

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5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Enomoto et al. taken with Kohno et al. in view of Takeda as applied to claim 1 in item 3 hereinabove, and further in view of Zenda (USP 5,592,187).

Regarding claim 3, Enomoto et al. taken with Kohno et al. in view of Takeda **does not teach** the said driving apparatus wherein the data blanking period includes a vertical back porch period spanning from an end of a vertical synchronization signal to a starting point of data enable signals.

Zenda **teaches** a display control system (col. 1, lines 43-67 and col. 2, lines 1-7); Zenda further **teaches** the said driving apparatus wherein the data blanking period includes a vertical back porch period spanning from an end of a vertical synchronization signal to a starting point of data enable signals.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to provide to the device as taught by Enomoto et al. taken with Kohno et al. in view of Takeda the feature as taught by Zenda in order to put in place the means to adjust the display period timing to facilitate displaying the same image on displays of different technologies.

6. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Enomoto et al. taken with Kohno et al. in view of Takeda as applied to claim 1 in item 3 hereinabove, and further in view of Seitz et al. (USP 4,484,192).

Relative to claim 10, Enomoto et al. taken with Kohno et al. in view of Takeda **does not teach** a driving method of a LCD comprising the step of generating first and second polarity inversion signals different from each other according to a number of horizontal synchronization signals supplied during a data blanking period.

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Seitz et al. **teaches** a moving map display (col. 2, lines 28-68 and col. 3, lines 1-41); Seitz et al. further **teaches** a driving method of a LCD comprising the step of generating first and second polarity inversion signals different from each other according to a number of horizontal synchronization signals supplied during a data blanking period.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to provide to the device as taught by Enomoto et al taken with Kohno et al. taken with Takeda the feature as taught by Seitz et al. in order to put in place means for generating horizontal and vertical synchronization signals, horizontal and vertical blanking signals and pixel and line signals.

7. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Enomoto et al. taken with Kohno et al. in view of Takeda, and further in view of Seitz et al. as applied to claim 10 in item 6 hereinabove, and further in view of and further in view of Lin et al.

Regarding claim 12, Enomoto et al. taken wit Kohno et al. in view Takeda and further in view of Seitz et al. **does not teach** the said driving apparatus wherein the polarity of the video data supplied to the LCD panel is inverted for each of two adjacent pixel cells.

Lin et al. **teaches** a dot inversion mode active matrix LCD display with pre-writing circuit.

(pg. 1, paras. 0008-9911); Lin et al. further **teaches teach** the said driving apparatus wherein the polarity of the video data supplied to the LCD panel is inverted for each of two adjacent pixel cells (pg. 2, para. 0018).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to provide to the device as taught by Enomoto et al. taken with Kohno et al. in view of Takeda and further in view of Seitz et al. the feature as taught by Lin et al. in order to put in place the

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means of an active matrix LCD with a pre-writing function which is applicable to be operate at an ultra-high frequency and to form a LCD panel with a high degree of resolution.

8. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Enomoto et al. taken with Kohno et al. in view of Takeda and further in view of Seitz et al. as applied to claim 10 in item 6 hereinabove, and further in view of Zenda (USP 5,592,187).

Regarding claim 13, Enomoto et al. taken wit Kohno et al. in view of Takeda and further in view of Seitz et al. **does not teach** the said driving apparatus wherein the data blanking period includes a vertical back porch period spanning from an end of a vertical synchronization signal to a starting point of data enable signals.

Zenda **teaches** a display control system (col. 1, lines 43-67 and col. 2, lines 1-7); Zenda further **teaches** the said driving apparatus wherein the data blanking period includes a vertical back porch period spanning from an end of a vertical synchronization signal to a starting point of data enable signals.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to provide to the device as taught by Enomoto et al. taken with Kohno et al. in view of Takeda and further in view of Seitz et al. the feature as taught by Zenda in order to put in place the means to adjust the display period timing to facilitate displaying the same image on displays of different technologies.

Allowable Subject Matter

9. Claim 4-9, 11 and 14-19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Relative to claim 4, the major difference between the teachings of the prior art of record (USP 5,796,379, Enomoto et al.; USP 6,366,271, Kohno et al. and USP 5,270,697, Takeda) and that of the instant invention is that said prior art of record **does not teach** a driving apparatus comprising a determining part for providing a determining result corresponding to whether the number of the horizontal synchronization signals supplied during the data blanking period is one of an odd-number of times and an even-number of times in accordance with the number counted by the counting part; a selector for supplying one of the first and second polarity inversion signals from the polarity inversion signal generator according to the determining result of the determining part to the data driver; and reset driver for generating a reset signal for resetting the polarity inversion signal generator, on a frame-by-frame basis, the detector, the counting part and the determining part.

Regarding claim 11, the major difference between the teachings of the said prior art of record and that of the instant invention is that said prior art of record **does not teach** a driving method for a LCD wherein the polarity of the first polarity inversion signal is inverted by two horizontal synchronization signal units and the second polarity inversion signal is delayed by one horizontal synchronization signal unit.

Relative to claim 14, the major difference between the teachings of the said prior art of record

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and that of the instant invention is that said prior art of record **does not teach** a driving method for a LCD comprising selecting one of the non-inverted and inverted first polarity inversion signals in response to the polarity inversion selection signal; and generating a second polarity inversion signal based on the first polarity inversion signal and the polarity signal.

Relative to claim 16, the major difference between the teachings of the said prior art of record and that of the instant invention is that said prior art of record **does not teach** a driving method for a LCD comprising determining a determining result based on whether the number of horizontal synchronization signals supplied during the data blanking period is one of an odd-number of times or an even-number of times according to the counted number; and supplying one of the first and second polarity inversion signals according to the determining result to the data driver.

Regarding claim 17, the major difference between the teachings of the said prior art of record and that of the instant invention is that said prior art of record **does not teach** a driving method for a LCD wherein the number of horizontal synchronization signals supplied during the data blanking period is an odd-number of times and the video data polarity is controlled by the second polarity inversion signal.

Regarding claim 18, the major difference between the teachings of the said prior art of record and that of the instant invention is that said prior art of record **does not teach** a driving method for a LCD wherein the number of horizontal synchronization signals supplied during the data blanking period is an even-number of times and the video data polarity is controlled by the first polarity inversion signal.

Relative to claim 19, the major difference between the teachings of the said prior art of record

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and that of the instant invention is that said prior art of record **does not teach** a driving method for a LCD wherein the step of generating the first and the second polarity inversion signals and the step of controlling the video data ;polarity are reset for each frame.

10. Claims 20 and 21 are allowed.

11. The following is an examiner's statement of reasons for allowance:

Relative to claim 20 the major difference between the teachings of the said prior art of record and that of the instant invention is that said Prior art of record **does not teach** a driving apparatus comprising a determining part for providing a determining result corresponding to whether the number of the horizontal synchronization signals supplied during the data blanking period is one of an odd-number of times and an even-number of times in accordance with the number counted by the counting part; a selector for supplying one of the first and second polarity inversion signals from the polarity inversion signal generator according to the determining result of the determining part to the data driver; and reset driver for generating a reset signal for resetting the polarity inversion signal generator, on a frame-by-frame basis, the detector, the counting part and the determining part.

Relative to claim 21, the major difference between the teachings of the said prior art of record and that of the instant invention is that said prior art of record **does not teach** a driving method for a LCD wherein the step of generating the first and the second polarity inversion signals and the step of controlling the video data ;polarity are reset for each frame.

Response to Applicant's Remarks

12. Regarding Applicant's remarks relative to amended claim 1, said remarks "Kohno et al. does not teach the step of controlling a polarity of the video data by supplying a selected one of the first and second polarity inversion signals to the data driver". Said limitation is a new amendment to claim 1 and is addressed in the current rejection of claim 1 in item 3 hereinabove.

Applicant's argument relative to claims 2, 3, 12 and 13, filed January 4, 2006, have been fully considered but they are not persuasive.

Regarding claims 2 and 12, Lin et al (Pub. No. 2001/0046002) teaches a LCD panel wherein the polarity of the video data supplied is inverted for each of two adjacent pixel cells. (pg. 2, para. 0018).

Regarding claims 3 and 13, Zenda (USP5,592,187) a display device the data blanking period includes a vertical back porch period spanning from an end of a vertical synchronization signal to starting point of data enable signals.

Applicant's arguments relative to claim 10, filed January 4, 2006, have been fully considered but they are not persuasive.

Seitz et al. (USP 4,484,192) teaches a operational characteristics common to display devices and is appropriate to this application.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U. S. Patent No. 5,805,149 Yuki et al.

U. S. Patent No. 5,801,767 Wu

Final Rejection

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Examiner's Note

15. Applicant, please note the change in Art Unit Number from 2677 to 2629.

Where applicable, future correspondence should refer to AU 2629. Thank You.

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To Respond

16 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vincent E. Kovalick whose telephone number is 571-272-7669. The examiner can normally be reached on Monday-Thursday 7:30- 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on 571-272-7681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Vincent E. Kovalick
March 21, 2006



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